

2 U.S. UNITED STATES DEPARTMENT OF AGRICULTURE

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3 Productive Electric Applications

To Help Meet National Goals //

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"Big Steel" is one of the Nation's basic industries. We are quite proud of the fact that we can produce more than one hundred million tons of this metal which is used both in industry and for military purposes. Agriculture is also a basic industry, but few of us realize that agricultural products are also measured by the hundred million tons. For illustration, in 1951 we produced one hundred million tons of hay. We also produced one hundred million tons of corn and another one hundred million tons of small grain including wheat, rye, barley, oats and sorghum grains.

Unfortunately the losses in agricultural production are very great. It is highly improbable that our mass production industry could have developed if they suffered losses that are accepted by agriculture every year in producing their raw materials. In the past agriculture has considered its losses as inevitable. Henry Ford is known for the efficient use of electric power which he used to the greatest extent in controlling factory production. If he had similar losses in the raw products that he uses to build his cars, one of two things would result. Either his automobiles would be so high priced that no one could afford to buy them or the construction materials would be so reduced in quantity and quality that the cars probably would not be fit to ride in. It has been estimated that on our farms approximately 25% of the raw products are lost as a result of bad weather or poor storage conditions. More than 25% of the young pigs and lambs are lost each year.

Farmers have been forced to accept losses because of the variableness of the weather. In fact, the weather is the greatest hazard that farmers must overcome in the every day business of living and producing farm products. Industry also has weather loss but they have learned to use electric power to reduce their losses and to increase efficiency. Eighty-five percent of our farms now have electric power. Farm people must now learn to use electric power to stop preventable losses and to increase efficiency wherever possible.

During the present emergency it is particularly important that farmers learn to use electric power in the production and preserving of food and fiber. They should also increase the efficiency of farm labor so that production can be maintained in spite of the transfer of young farmers to the armed forces and to industry.

Because of the emergency, the Department of Agriculture has set up certain production goals to be sure that our high agriculture production of the past five years can be maintained. At the present time we have very high levels of production in all fields of agriculture but in 1952 it is desirable that we produce at least 6% more than we did in 1951. These increases are primarily in the production of feed and fiber used in livestock and poultry production. The increases range up to 64% of certain items but for the most part it is only necessary to increase 1951 yields of staple grains about 15%. The average increase of 6% may seem low until we remember that 6% of 100 million tons of any product is 6 million tons. Concern is felt at the present time because our reserves of feed grains and hay are quite low. If we are not able to grow enough extra grain and hay so that our animals can be fed and reserves increased in 1952, it may be necessary to reduce the production of livestock in 1953.

For the past two years more feed has been consumed by our animals than we have produced; consequently, they have been fed on the reserves stored up in previous years. Feed waste has always been high. It is now essential that preventable losses be stopped.

Inadequate protection for young animals during or immediately after birth is also wasteful of feed. Every young animal that dies represents an immediate loss of feed measured by its proportion of the feed consumed by its mother. Cold, wet and damp weather causes the death of many young animals and retards the development on many that survive.

Electric brooding equipment can reduce these losses by about half. Heat lamps, heat panels, heating cable and hover type brooders are very effective in reducing losses and increasing production. Young animals that are chilled after birth regain their health and vigor slowly. A good start with electric brooders increases their rate of growth and development.

Since livestock production is on a very high level no goals for increased production of animals and animal products have been set. We have a very large animal population. They will require 130 million tons of feed grains in 1952. If we just maintain the production of 1951 we will have only 18 million tons of feed grains as a reserve to start 1953. This is entirely too low for safety. If we have a bad crop year in 1952, we may have an even smaller reserve than that now anticipated.

Increased efficiency on the farm is necessary because of many factors. Our labor supply is low. We will probably have 300,000 less farmers in 1953 than we had in 1952. Consequently the available labor must be put to work very efficiently in order to maintain and increase production.

Efficiency can be greatly increased by reducing the labor requirements of many farm operations. This is particularly true of those operations that have been done by hand power or where personal supervision has been required in the operation of some farm machines.

Farm machinery production is now and will continue to be limited because of material shortages. Such machines as tractors, corn pickers, combined harvester - threshers and cotton pickers will be in short supply. Consequently, it will be necessary to increase labor efficiency in other farm

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activities in order for hand labor to have the time required to harvest the crops that might have been harvested with mechanical machines had we been able to produce them.

In the last two wars we were able to plow up a great deal of virgin land which helped to produce record crop yields. At the present time there is no new land available. The existing land will have to produce the food and fiber that is needed.

Fertilizer has become increasingly important in order to maintain crop yields on land that has been under cultivation for a long period of time. In 1952 we will have 50 million tons less fertilizer than we had last year.

The problem of increasing production is largely that of man against nature. Unseasonable weather at planting or harvesting time greatly reduces the quantity of feed which we can obtain. A shortage of manpower increases such losses because of the physical impossibility of doing a large amount of work in the limited amount of time during rush seasons.

High moisture content results in the spoilage of almost unbelievable quantities of hay and grain during or after harvest. Inclement weather which causes difficult field drying conditions not only delays harvest but results in very large field losses. Leaching, bleaching and shattering leaves probably cause a 25% loss in the original food value of all of the hay produced in the United States. When crops are stored with a high moisture content they may be lost because of spontaneous combustion which not only destroys the crops but the buildings in which they are stored also. Under some conditions there is not enough heat to cause a fire but oxidation loss which may be described as a "slow burning" is very destructive. Food nutrients including proteins, fats, carbohydrates and vitamins are destroyed by this slow heating process to a far greater extent than is recognized by most people.

Unfortunately our modern farm machinery contributes to these heavy storage losses caused by too high moisture content. In the old days when grain was harvested with binders and headers it was shocked in the field or put in stacks for a period of a few weeks to a few months until it could be threshed. During the waiting period the moisture content in the grain was reduced by a natural drying process. In my community we spoke of the process as the "sweat." In other words, the moisture came to the surface of the kernels of grain and was evaporated by the sun and wind before it was threshed. Today our modern machines gather the grain in the field and it is stored immediately. Since these machines are marvelously efficient they enable farmers to harvest their grain before it is dry enough for safe storage. Frequently small grains are harvested with moisture content up to 20% and ear corn is picked with a moisture content as high as 30% or 35%. No grain should be stored with a moisture content higher than 15% and it is much better if the moisture is reduced to 12%.

Until recently the only way moisture content could be safely reduced on the farm was to leave the grain and hay in the fields until a low moisture content was reached. This waiting period resulted in very large field losses due to rain, hail, wind storms and other hazards, which cause the grain to be shattered on the ground or which may break down the stalks

making it impossible to gather some of the grain. In the West we have seen combines standing idle in the field until 10 a.m. and after 4 p.m. because the moisture content of the grain is not low enough for safe storage. When farmers become impatient or frightened because of bad weather predictions they frequently harvest grain knowing that it will not keep properly. They try to overcome these losses by moving the grain in the bins with a scoop shovel to stop heating. This is very slow, laborious work and is generally very ineffective. In other cases they sell the grain taking a heavy price cut to get rid of it before spoilage occurs.

During the past 10 years a great deal of research and practical development has been done in the artificial drying of both grain and hay after storage. In most cases such drying on the farm is done without heat. Under certain climatic conditions when the weather remains constantly cool and the relative humidity is high it is necessary to use heat. This drying process is done by blowing air through the stored products. It is accomplished with blower fans which may force from one to 25 thousand cubic feet of air per minute through the stored products.

Electricity is the most satisfactory source of power for driving these fans. Motors ranging from one HP to $7\frac{1}{2}$ HP can be used. Automatic controls including time clocks, thermostats and humidistats may be used to obtain accurate and automatic control of the drying process. Such equipment can be used for drying hay, small grain, shelled corn and ear corn. The quantity of material that can be dried at one time varies from 10 to 100 tons of hay or from 300 bushels to 25 thousand bushels of grain, depending on the weather conditions, the time of year and the moisture content of the stored products.

Grain and hay drying can be done in the ordinary bins and hay mows found on the average farm. Some modification of the buildings must be made in order to force the air uniformly through the stored products. Information on these modifications can be obtained from the county agent, the state extension service, from USDA bulletins or from your cooperative electrification adviser.

In the past 40 years there have been great improvements in the mechanization and electrification of agriculture. To date most of these improvements have been in field machinery, in internal combustion engines for power, in crop varieties and in cultural practices which include the use of fertilizers, germicidal disease controls and insect pest control. These developments have greatly extended the production of agriculture until we have reached the highest levels ever attained. In 1952 a general increase of 6% over last year is planned. Our greatest asset for achieving such a goal is electric power. Eighty-five percent of our farms are electrified but less than 5% are making extensive use of electric power in a production program. Since we cannot expect increases from other productive methods it is essential that every farmer take advantage of productive electric power to obtain the necessary increases.

With electric power we can obtain better control of crop conditioning for farm storing. Many new developments will help stop the spoilage of huge quantities of grain and roughage. They will improve the quality of farm produce and they will increase production because the new techniques will speed up the harvest and storage of crops and by preventing weather losses.

1. Estimates have been made that electric power can be used to up-grade or save 50 million tons of hay.
2. Up-grade two thousand million bushels of grain.
3. Prevent the death of 15 million little pigs.
4. Prevent the loss of two million lambs.
5. Do the work requiring 10 million man hours on the farm every day, thus releasing a great amount of labor to help obtain the 6% increase.

with the power of the sun, and the power of the moon, and the power of the stars, and the power of the planets, and the power of the elements, and the power of the universe, and the power of the God who created them all.

And the power of the God who created them all, and the power of the God who sustains them all, and the power of the God who will destroy them all, and the power of the God who will create them all again.

And the power of the God who created them all, and the power of the God who sustains them all, and the power of the God who will destroy them all, and the power of the God who will create them all again.

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